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THE ANTIFRICTION BEARINGS INDUSTRY IN CHINA

ORR PROJECT 1 (1P-3538)

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SUMMARY AND CONCLUSIONS

In Communist China, as in the East European Satellites, the antifriction bearings industry is of vital importance to an expanding industrial economy especially to the machine-building industry and industries producing military end items, which are major consumers of antifriction bearings. Although there is relatively little information available on the production of antifriction bearings in Communist China, at present there are at least four plants manufacturing bearings in that country. The first major plant was established by the Japanese in Manchuria in 1938. This plant which produced 132,000 bearings in 1944 was practically completely dismantled by the Soviets in 1945. Production in 1952 in Communist China, which included output from two Manchurian plants and two in Shanghai is estimated to have been at least about 130,000 bearings. A new ball bearing plant is also being built in Harbin with Soviet aid which will substantially increase Communist China's production in the future.

Communist China's two main sources of imports are from the Soviet Union and from the West. The majority of shipments from the latter source enter China via Hong Kong. In 1951 a total of 730,000 bearings are estimated to have been imported into China. A little less than half of these are believed to have been imported from the West and Hong Kong.

There are no direct reports on Communist China's requirements. The requirements for 1951 have been estimated to be approximately 1.5 million bearings. Comparatively speaking this would mean that Communist China's 1951 antifriction bearing requirements are about one-third those of Poland or Hungary for 1951.

In 1951, it is estimated that Communist China supplied about 25% of its own requirements through domestic production. Including estimated imports, about 75% of the requirements were fulfilled. The deficit of antifriction bearings in 1951 has been estimated to have been about 370,000.

At present Communist China is largely dependent on imports to satisfy the majority of her antifriction bearings requirements. These requirements will continue to rise with planned increased production of machine tools, electrical equipment, transportation equipment and other equipment utilizing antifriction bearings. The Chinese Communists have an industrial construction program underway which is scheduled to produce at least ten more machine building and engineering industry factories before the end of 1955. Communist China will continue to be

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dependent on imports for her antifriction bearing requirements. . . .
to increase domestic production drastically within the existing
continuance of existing trade restrictions will impact the
economy of Communist China and also will have some indirect effect on the
and Eastern European satellites.

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I. INTRODUCTION

There is relatively little information available on the antifriction bearings industry in Communist China. With what information is available we have attempted to estimate China's position in regard to antifriction bearings by comparing domestic production and imports of this commodity against present and future requirements of the engineering and machine-building industries, for antifriction bearings.

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SECRET**II. DEVELOPMENT, ORGANIZATION AND PLANTS****A. Development**

It is believed that at present there are four factories in China producing antifriction bearings with a fifth plant under construction. Three of the plants are located in Manchuria. The first and at one time the most important factory for the production of bearings in what is today China was the Manchu Bearing Mfg. Co. This plant was established by Japanese at Wa-fang-tien in Manchuria in 1935. A very considerable portion of this plant was dismantled by the Soviets in 1945, and only very limited production was possible when the Chinese Communists first took it over in 1948. The plant at Shenyang (Mukden) is however, believed to be the largest antifriction bearings plant in Communist China today.

The two other plants which are located in Shanghai have been established since 1950. A fifth antifriction bearings plant is being built at Harbin with Soviet aid.

B. Organization

It is believed that at present the First Ministry of Machine Building is the organization which controls the bearing industry in Communist China. In 1952, the antifriction bearing industry undoubtedly came under the jurisdiction of the Ministry of Heavy Industry.

C. Plants

1. Wa-fang-tien Ball Bearing Plant. This factory was established by the Japanese Orient (Tokyo) Bearing Mfg. Co. as the main bearing plant in Manchuria. It was probably China's first complete antifriction bearing plant. In the last year of World War II (1944-45) this factory produced about 134,000 bearings, which represented one-half of the Manchurian demand for bearings in the last year of the war. According to the same source, a report based on the records of the Japanese company in Japan [redacted] the Soviets employed [redacted] to help dismantle the bearing plant. All of the equipment which was shipped to the Soviet Union is believed to have been destined for the 17 bearing factories in the Soviet Union. Reports indicate that enough equipment was left to produce bearings on a very limited scale - 10 standard size bearings a day in 1948. [redacted] This plant is still in operation, but it is not known for certain to what extent the Chinese Communists, with or without Soviet aid, have re-equipped it.

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There are scattered references to anti-friction bearing production in Communist China. A press report stated that in 1951 the Tung-pai Machine Works, of which the Tung-pai Ball Bearing Plant is apparently a part, manufactured "500 types of balls and ball bearings". 4/ 5/ This factory is probably China's largest single producer. There is another plant in Shenyang known as the No. 5 Machine Tool Factory which reportedly manufactures needle type bearings. 6/ It is not certain whether this is actually a distinct plant or just another name for the Tung-pai factory. The latter case is the more probable.

3. Shanghai Ball Bearing Plants. As far as can be determined there are two plants in Shanghai producing anti-friction bearings. One is believed to be the Transmarina Scientific Supply Co. In the spring of 1951 this organization was attempting to order additional machinery in Vienna for the manufacture of anti-friction bearings. 7/ This plant although comparatively small is thought to be capable of producing a variety of bearings. Bearings are also produced at another factory in Shanghai. This is believed to be the Ta Ta Bearing Company. 8/ This second plant, like the Transmarina, is believed to be relatively small but competent for producing useful varieties of anti-friction bearings.

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4. Projected Harbin Ball Bearing Plant. According to the statements of ~~members of~~ ^{eyewitnesses} ~~Harbin~~ ^{Harbin} a new ball bearing factory is being established in ~~that city.~~ ^{Harbin} ~~One of the reports specifically stated that the plant is being completely equipped and supervised by Soviet personnel.~~ 9/ Another source stated that work on this factory was scheduled to start in 1953. 10/ This fits in with the fact that the Soviets are known to be making considerable efforts to aid the Chinese Communists in the industrialization of Harbin.

5. Unconfirmed Miscellaneous Plants. Anti-friction bearings production has also been reported at other places in Communist China, but not enough information is available to confirm or deny these reports. ^{Other} Reported places of bearing production are:

a) Dairen - probably a small plant is still in existence. 11/ 12/ b) ~~Ch'in-nan-tai (near Sien-tai)~~ ^{Ch'in-nan-tai} ~~reported to be producing ball bearings of inferior quality in 1951.~~ 13/ c) Ch'in Feng machinery plant, Shang-hai 20/ d) Fu Hsuan Ball bearing plant, Shang-hai 21/.

SECRET**III. ESTIMATED PRODUCTION**

The following production estimates are admittedly rough and probably represent minimum figures. This is especially true when it is considered that only production figures for the known plants have been included under the Table I. and that possible production at other plants such as those included under "Unconfirmed Miscellaneous Plants" is not represented.

TABLE I. ESTIMATED MINIMUM ANTIFRICTION BEARING PRODUCTION IN COMMUNIST CHINA. (Bearing Units)

<u>Name and Location of Plant</u>	<u>1944</u>	<u>1948</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>
Wu-chang-tien Ball Bearing Plant Wu-chang-tien, Manchuria	432,000	3,000	18,000	21,800	25,000
Tung-pai Ball Bearing Plant Shenyang (Mukden), Manchuria	N.A.	24,000	144,000	172,800	190,000
TOTAL Manchurian Production	<u>432,000</u>	<u>27,000</u>	<u>262,000</u>	<u>194,600</u>	<u>215,000</u>
Transmarina Scientific Supply Co. Shanghai	N.A.	N.A.	N.A.	66,000	100,000
Ta Ta Bearing Co., Shanghai	N.A.	N.A.	N.A.	100,000	116,000
TOTAL Estimated Minimum Chinese Communist Antifriction Bearing Production	<u>432,000</u>	<u>27,000</u>	<u>262,000</u>	<u>360,600</u>	<u>431,000</u>

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SECRET**IV. IMPORTS****A. Method of Procurement**

There are two main sources for the imports of antifriction bearings into Communist China. One is from the USSR, East Germany and Czechoslovakia. The other is from Western Europe with the majority of shipments entering the China mainland illegally via Hong Kong.

B. Estimated Imports - 1951**1. Western Europe and Hong Kong.**

On the basis of numerous reports covering legal and illegal imports of antifriction bearings into Communist China from Western Europe, via Hong Kong and direct, it is possible to estimate that in 1951 some 325,000 bearings entered Communist China. 13/ 14/ 15/ Only 45,000 of the above figure or less are believed to have entered direct from the west while the other 86% or 280,000 are believed to have come in via Hong Kong. 13/ 14/ 15/

2. Intra-Bloc

Due to the priorities of the Korean war, it is believed that the Soviet Union and some Eastern European Satellites were required to export some antifriction bearings to Communist China. It is believed that in 1951 approximately 400,000 bearings were exported ^{to} Communist China from the Soviet Bloc. 16/ 15/

V. REQUIREMENTS

There are no direct reports on Communist China's antifriction bearings requirements. It is possible, however to make a rough estimate of the requirements for 1951 by using the following methodology. In 1944 Manchuria's total bearing requirements are known to have been 860,000. 1/ Based on estimates of gross national product, Manchuria supplied approximately 65% of China's total engineering industry output. 17/ We can then assume that China's total requirements for ball and roller bearings would follow the same pattern which would mean that China's total requirements in 1944 would be approximately 1,323,000 bearings. Again, based on estimates of GNP, China's total engineering (excluding armaments but including ships and aircraft) industries in 1951 expanded by approximately 112% of 1944. 17/ We ~~have~~ ^{can be} assumed that the demand for ball and roller bearings would expand in the same relationship. If we accept this assumption, the total requirements for ball and roller bearing in 1951 ~~have been~~ ^{can be} estimated to ~~be~~ have been approximately 1,400,000. This does not appear to be an unreasonable estimate when it is considered that, on the basis of bearings requirements, this means that China's requirements for antifriction bearings in 1951 are approximately one-third those of Poland or Hong Kong in 1951.

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~~SECRET~~VI. BALANCE (Surplus or Deficit)

TABLE II.

A. Antifriction Bearing Position of Communist China 1951

	<u>No. of Bearings</u>
Estimated Domestic Output	330,000
Estimated Imports	<u>730,000</u>
Total Available Supply	1,110,000
Estimated Requirements	<u>1,480,000</u>
Deficit	370,000

From Table II it appears that in 1951 Communist China supplied only 30 percent of its requirements through domestic production. In the same year China imported approximately 50 percent of its requirements. The balance represents a deficit in the supply of bearings for Chinese industry.

It should be noted that the above estimates are admittedly rough.

Production estimates represent an estimated minimal figure. The methodology used for arriving at requirements estimates is also an approximation. Therefore, the deficit figure is an approximation of 370,000.

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II. BEARING PRODUCTION

Communist China's output of machine tools, electrical equipment, transportation equipment, and other equipment utilizing antifriction bearings has been steadily increasing over the past several years. In addition to this present increasing production of the above goods which will necessitate a greater supply of bearings, there is also the fact that the Chinese Communists have an industrial construction program underway which is scheduled to produce at least 10 more machine-building and engineering industry factories before the end of 1955. ¹⁹ This construction program, incidentally, is very large ¹⁷ dependent upon aid from the USSR. Future production at these additional plants will mean greater and greater requirements for antifriction bearings. Unless Communist China intends to increase her own antifriction bearing industry substantially over what appears to be presently planned production it looks as though she will continue to be dependent upon imports to a considerable degree in order to satisfy all of her future requirements.

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